

PATENT COOPERATION TREATY

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REC'D 30 MAY 2006

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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| Applicant's or agent's file reference PAM-027-PCT | FOR FURTHER ACTION | | See Form PCT/IPEA/416 | |
| International application No. PCT/EP2005/001267 | International filing date (day/month/year) 08.02.2005 | Priority date (day/month/year) 11.02.2004 | | |
| International Patent Classification (IPC) or national classification and IPC INV. B01L3/02 | | | | |
| Applicant PAMGENE B.V. et al. | | | | |
| <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of 2 sheets, as follows:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. <p>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> | | | | |
| <p>4. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Box No. I Basis of the report <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input type="checkbox"/> Box No. VI Certain documents cited <input type="checkbox"/> Box No. VII Certain defects in the international application <input type="checkbox"/> Box No. VIII Certain observations on the international application | | | | |
| Date of submission of the demand 06.12.2005 | Date of completion of this report 22.05.2006 | | | |
| Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016 | Authorized officer Cantalapiedra, I Telephone No. +31 70 340-4260 | | | |
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**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2005/001267

Box No. I Basis of the report

1. With regard to the **language**, this report is based on
 - the international application in the language in which it was filed
 - a translation of the international application into , which is the language of a translation furnished for the purposes of:
 - international search (under Rules 12.3(a) and 23.1(b))
 - publication of the international application (under Rule 12.4(a))
 - international preliminary examination (under Rules 55.2(a) and/or 55.3(a))
2. With regard to the **elements*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

Description, Pages

1-29 as originally filed

Claims, Numbers

1-9 received on 17.03.2006 with letter of 15.03.2006

Drawings, Sheets

1/11-11/11 as originally filed

- a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

- The amendments have resulted in the cancellation of:
 - the description, pages
 - the claims, Nos.
 - the drawings, sheets/figs
 - the sequence listing (*specify*):
 - any table(s) related to sequence listing (*specify*):
- This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 - the description, pages
 - the claims, Nos.
 - the drawings, sheets/figs
 - the sequence listing (*specify*):
 - any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N) Yes: Claims 1-9

 No: Claims

Inventive step (IS) Yes: Claims 1-9

 No: Claims

Industrial applicability (IA) Yes: Claims 1-9

 No: Claims

2. Citations and explanations (Rule 70.7):

see separate sheet

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Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1) Reference is made to the following documents:

D4: US-A-5 556 598 (KENRICK MICHAEL K ET AL) 17 September 1996 (1996-09-17)

2) The document D4 is regarded as being the closest prior art to the subject-matter of claim 1, and shows (the references in parentheses applying to this document):

A device for analysing an interaction between target and probe molecules, comprising:
- a tubular housing having a proximal end and a distal end defining an internal flow passageway (D4, fig 1), and
- a flow through support member provided within or on the housing obstructing said internal passageway (D4, feature 17),
whereby said flow through support member is in the form of a sheet, film or membrane is provided with through going channels, said channels provided with probe molecules suitable for allowing an interaction between target and probe molecules (D4, col 5, lines 54-61).

The subject-matter of claim 1 differs from this known in that:

The flow trough support member is provided with through going channels having a pore size diameter between 50- 400 nm.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as to be able to maximize the binding capacity of the flow trough support member.

The solution to this problem proposed in claim 1 of the present application is considered

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as involving an inventive step (Article 33(3) PCT) for the following reasons:

Document D4, teaches away from using flow trough support member having a pore size of between 50-400 nm, this may be inferred from D4, col 6, lines 21-27 disclosing that:

"1 micrometer membrane is preferred. [...] Also 0.45 micrometer nitrocellulose has been used successfully, as has 0.45 micrometer nylon, although the flow rate and hence washing efficiency were reduced (see Example 1)."

therefore the skilled person departing from D4 would not try to reduce more the pore size, as flow rate and washing efficiency problems will be expected.

None of the other documents at hand discloses flow trough support members in the form of sheets or membranes, or with this magnitude of pore size.

Claim 1, define therefore inventive subject-matter while solving the problem posed.

2.1) Claims 2-7 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

3) The independent claims 8 (apparatus) and 9 (method) are to be used with the novel and inventive device defined in claim 1, and are therefore also new and inventive, mutatis-mutandis.

EPO - DG 1

17.03.2006

(95)

Claims (retyped)

1. A device for analysing an interaction between target and probe molecules, comprising:

- a tubular housing having a proximal end and a distal end defining an internal flow passageway, and
- a flow through support member provided within or on the housing obstructing said internal passageway,

whereby said flow through support member is in the form of a sheet, film or membrane and is provided with through going channels having a pore size diameter between 50-400 nm, said channels provided with probe molecules suitable for allowing an interaction between target and probe molecules.

2. The device according to claim 1, whereby the support member is provided at or near the distal end of the housing.

3. The device according to claims 1 or 2, wherein said support member is chosen from the group consisting of metals, ceramic metal oxides, silicon, organic polymers and metal oxides, preferably aluminium oxide.

4. The device according to any of the claims 1 to 3, wherein said support member is optically transparent or translucent.

5. The device according to any of the claims 1 or 4, wherein said channels extend substantially coaxial with the longitudinal axis of the housing.

6. The device according to any of the claims 1 to 5, wherein the plane of the support member extends substantially perpendicular to the longitudinal axis of the housing.

7. The device according to any of the claims 1 to 6, wherein the support member spans the bore of the housing.
8. An apparatus for analysing an interaction between target and probe molecules, comprising:
 - (a) a handling station comprising a handling device, for aspirating and/or dispensing fluid medium, said handling device comprising a device according to any of the claims 1 to 7, mounted thereto,
 - (b) a means for transporting said handling station to a plurality of sections,
 - (c) at least one incubation section comprising an incubation device, for administering a fluid sample comprising target molecules to the support member, incubating the support member comprising the fluid sample and/or washing the support member, and
 - (d) an analysis section comprising a detection device for detecting an interaction between target and probe molecules, thereby analysing an interaction.
9. Method for the analysis of an interaction between target and probe molecules, comprising:
 - (a) administering a sample fluid possibly comprising target molecules to the support member of the device according to any of the claims 1 to 7, or the apparatus of claim 8,
 - (b) entering the sample fluid into the channels of the support member by capillary forces or by applying a pressure difference over the support member, whereby the target molecules are contacted with the probe molecules,
 - (c) possibly generating an alternating flow through the support member whereby at least part of the sample is forced to pass through the channels from the distal side of the support member to the proximal side of the support member and back at least one time, under conditions enabling the interaction between target and probe molecules, and
 - (d) analysing an interaction between target and probe molecules.